

INTERNAL AUDIT REPORT

OPERATIONAL AUDIT

TNC RE-MATCH -
ENVIRONMENTAL KEY PERFORMANCE INDICATOR (E-KPI)

DECEMBER 2017 – MARCH 2018

ISSUE DATE: JUNE 8, 2018

REPORT NO. 2018-05

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EXECUTIVE SUMMARY

Internal Audit (IA) completed an audit of the Re-match Program for the period December 5, 2017 through March 31, 2018. The audit was performed to evaluate the Re-match program and its impact on CO₂ emissions. We also evaluated the assumptions and accuracy of the Environmental Key Performance Indicator or E-KPI.

Transportation Network Companies (TNCs) began operations at Sea-Tac Airport under a Pilot Program Operating Agreement in April 2016. The agreement allows TNCs to pick-up airport riders using a per-trip fee as the basis for concession fees. Since expiration of the agreement in April of 2017, the TNCs have been operating on a month to month basis.

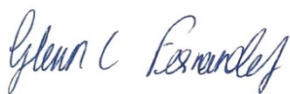
The Port expected the TNCs to achieve environmental standards equivalent to the on-demand taxi fleet, currently East Side for Hire (ESFH). In lieu of using a mileage standard, the Port chose to develop and use an E-KPI to measure carbon emissions from TNC vehicles. Equivalence is measured by an E-KPI ≤ 10.82 lbs. of CO₂ per typical passenger trip. To comply with the E-KPI requirement, TNCs, initially required drivers picking up at the airport, to possess a vehicle with a fuel efficiency of at least 45 miles per gallon (MPG).

Re-match was introduced at the airport on December 5, 2017. The program allows TNCs, including those that don't meet the MPG restriction, who complete an airport drop-off, to immediately receive a pick-up request, without having to wait in the holding lot. Under Re-match, vehicles that don't meet the 45 MPG restriction are permitted to pick-up passengers, if they receive a matched trip, after completing an airport drop-off.

We noted the following issue which is explained in more detail on page six.

- 1) The Re-match program is an innovative solution that reduces deadheading and greenhouse gases, while also having the potential to ease congestion at airport drives. However, the E-KPI in its current form could result in TNC's serving the airport with a fleet of vehicles that are not considered "green" vehicles.

We extend our appreciation to Port management and staff of the Aviation Commercial Management and the Environment / Sustainability Departments for their assistance and cooperation during the audit.



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RESPONSIBLE MANAGEMENT TEAM

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BACKGROUND

The Port of Seattle entered into Pilot Program Operating Agreements with Transportation Network Companies (TNCs) in April 2016 through March 2017. The Agreements provide TNC's to pick-up airport riders using a per-trip fee as the basis for concession fees. In April 2017, the TNCs were operating on a month to month basis.

TNCs use a new transportation business model that provides prearranged transportation services for compensation. These companies connect riders and drivers through an online-based application or platform (i.e. smartphone). Passengers use the application to request a ride to a destination of their choice. Once the passenger makes the requests, the Global Positioning System (GPS) location is sent to a driver, who can then proceed to pick up the passenger.

Re-match was introduced at the airport on December 5, 2017. One of the key objectives of the Re-match Program was to reduce deadheading, or trips without passengers, and therefore reduce the environmental impact of TNCs. The program allows TNC's, including those that don't meet the miles per gallon (MPG) restriction, who completed an airport drop-off, to simultaneously receive a pickup request and drive directly to the 3rd level, without having to wait in the 160th Street holding lot. Under the Re-match program, vehicles that don't meet the MPG restriction of 45 MPG are permitted to pick up passengers, only if they receive a matched trip, after completing an airport drop-off. Both Uber and Lyft started with the pilot Re-Match program in December 2017; however, Lyft discontinued the program after one month.

To monitor compliance with the environmental requirements of the TNCs operating agreements, the Port uses the E-KPI metric as a tool that demonstrates the equivalency with the environmental performance of outbound, on-demand taxis at Sea-Tac Airport. It is expressed in units of lbs. of CO₂ per typical passenger-trip and the formula sums the Airport drop-off trip fuel consumption with the Airport pick-up trip fuel consumption multiplied by the carbon emissions per fuel consumed (Appendix B).

If the required metric (10.82 lbs. CO₂) is not achieved for the third quarter or any subsequent quarter, the per-trip fee for the three month period beginning with the second month of the next quarter increases according to the table below.

INCREASE IN PER-TRIP FEES	
Quarters of Noncompliance	Fee Multiplier
1st Nonconsecutive Quarter of Noncompliance	2X
2nd Consecutive Quarter of Noncompliance	3X
3rd consecutive Quarter of Noncompliance	4X

AUDIT SCOPE AND METHODOLOGY

We conducted this audit in accordance with Generally Accepted Government Auditing Standards and the International Standards for the Professional Practice of Internal Auditing. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The period audited was December 5, 2017 – March 31, 2018 and included the following procedures:

E-KPI Metric Accuracy

- Reviewed the monthly process for compiling TNC Performance Reports.
- Validated the accuracy of Uber vehicle and MPG data.
- Performed validation procedures of deadheading data.
- Recalculated and validated the accuracy and reasonableness of the monthly E-KPI metric.

E-KPI Compliance

- Verified the monthly Uber E-KPI metric complied with the TNC Pilot Program Operating Agreement.
- Recalculated Uber and Lyft's monthly E-KPI metric using both drop-off and pick-up weighted average MPG data.

SCHEDULE OF FINDINGS AND RECOMMENDATIONS

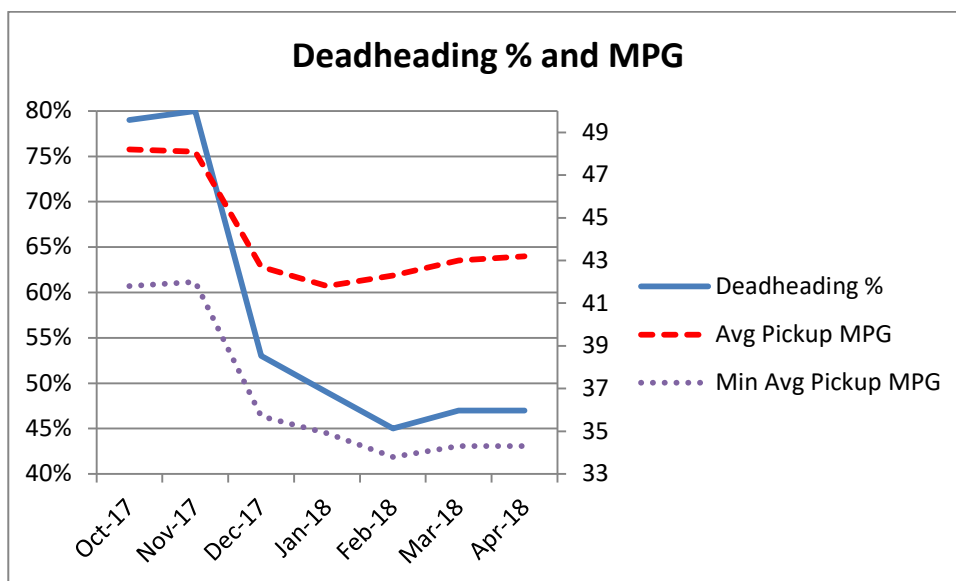
1) RATING: HIGH

The Re-match program is an innovative solution that reduces deadheading and greenhouse gases, while also having the potential to ease congestion at airport drives. However, the E-KPI in its current form could result in TNC’s serving the airport with a fleet of vehicles that are not considered “green” vehicles.

The Pilot Program Operating Agreements (Agreements) require an E-KPI of less than or equal to 10.82 lbs. of CO₂ per typical passenger trip. The environmental requirement (E-KPI) was developed to create a “level playing field” with the on-demand taxi contract (ESFH); however, TNC’s have a large volume of drop-offs at the airport, whereas on-demand taxi drop-offs (ESFH) at the airport are minimal. This large disparity in drop-offs, results in TNCs having a large pool of drivers, who have just dropped off a customer, who can then turn around and pick up another customer.

With the introduction of the Re-match Program, TNC deadheading has decreased at an increasingly fast rate. The E-KPI formula in its current form can be leveraged by the TNCs to change the pool of vehicles that pick-up at the airport to a fleet that is not aligned to the Port’s strategy of “the greenest, and most energy efficient port in North America.” For example, if deadheading decreased to 20% of trips, the current formula will allow TNCs to serve the airport with a fleet of vehicles averaging only 28 MPG. This may also be perceived as unfair to TNC drivers who invested in vehicles that meet the “green” vehicle standards.

The graph below shows the quick drop in deadheading with the introduction of the TNC Re-match program. As deadheading declined, the average MPG of vehicles picking up at the airport also declined. The decrease in the deadheading percentage also decreased the minimum average MPG that would be allowed in order to maintain compliance with the current 10.82 E-KPI requirement.



Additionally, the current E-KPI formula includes a component for inbound fuel consumption based upon the average miles per gallon of outbound trips. The TNC Agreements state “for simplicity, we will assume

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the WA-MPG for inbound vehicles is the same as outbound for each TNC.” The description for this assumption should be reworded to assure transparency.

Recommendation

IA recommends that when the contract is renewed, the E-KPI Methodology should be rewritten to assure transparency with assumptions that are made and any limitations with the metric. We also recommend that management re-evaluate the formula to identify and eliminate potential opportunities that could be exploited under the existing E-KPI calculation.

Finally, we recommend streamlining the penalty for not meeting the E-KPI metric so that it is easily understood and applied.

Management Response/Action

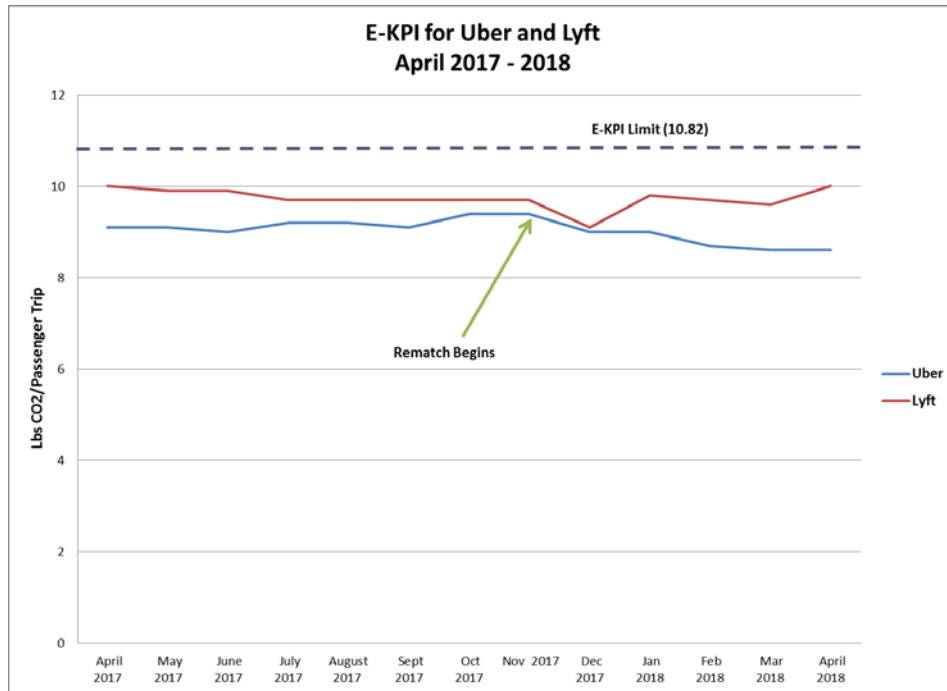
The E-KPI formula is a performance standard that calculates the *combined* environmental benefit of the fuel efficiency and the deadheading reduction of TNC pick-up service here at Sea-Tac. The E-KPI does not set a specific fuel efficiency requirement for the TNC vehicles picking up passengers. Instead, the E-KPI limits the amount of CO₂ emissions on a per passenger trip basis (10.82 lbs CO₂/typical passenger trip). A TNC can allow vehicles with fuel efficiency less than 45 MPG to pick up at the airport as long as the TNC fleet also reduces a corresponding amount of deadheading.

The E-KPI approach advances the Century Agenda because it encourages fleet efficiency and reduces carbon emissions of TNCs picking up passengers at Sea-Tac. The efficiency of the Re-match program does more to reduce TNC carbon emissions than having a pick-up vehicle MPG requirement, due to the dramatic reductions in deadheading the TNCs are able to achieve. This reduction also serves to reduce ‘reverse’ deadheading (TNC vehicles leaving the airport without a passenger after dropping off because they don’t meet the TNCs’ MPG threshold).

The E-KPI was intentionally designed to encourage TNCs to leverage their ability to reduce deadheading, as well as their ability to match riders via UberPOOL and Lyft Line. This audit report appears to be based on a different interpretation of what it means to be a ‘green’ fleet. The Environment & Sustainability COE considers the overall efficiency, environmental performance and emissions of a fleet’s operations to be a measure of its ‘green’-ness, with the MPG rating of the vehicles serving as one possible (but not required) means of reaching that goal.

This Schedule of Findings does not include an analysis of the effectiveness of Re-match in reducing congestion and CO₂ emissions. Data collected by the Port show that deadheading has been reduced approximately 30% since the introduction of Re-match, resulting in a 7% reduction of CO₂ per ‘typical’ trip. This is also illustrated in the graph below.

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When the TNC contract is renewed, or before any long term agreement is signed, we will review the overall TNC performance under the E-KPI approach to assure we continue to reduce emissions through highly efficient operations and service providers at the Airport. Additionally, assumptions made in the E-KPI equation will be more clearly described in the contract to eliminate any possible confusion about how the equation is applied.

DUE DATE: INITIAL 12/31/2018

Appendix

APPENDIX A: RISK RATINGS

Findings identified during the course of the audit are assigned a risk rating, as outlined in the table below. The risk rating is based on the financial, operational, compliance or reputational impact the issue identified has on the Port. Items deemed “Low Risk” will be considered “Exit Items” and will not be brought to the final report.

Rating	Financial	Internal Controls	Compliance	Public	Port Commission/ Management
HIGH	Large financial impact Remiss in responsibilities of being a custodian of public trust	Missing, or inadequate key internal controls	Noncompliance with applicable Federal, State, and Local Laws, or Port Policies	High probability for external audit issues and/or negative public perception	Important Requires immediate attention
MEDIUM	Moderate financial impact	Partial controls Not adequate to identify noncompliance or misappropriation timely	Inconsistent compliance with Federal, State, and Local Laws, or Port Policies	Potential for external audit issues and/or negative public perception	Relatively important May or may not require immediate attention
LOW/ Exit Items	Low financial impact	Internal controls in place but not consistently efficient or effective Implementing/enhancing controls could prevent future problems	Generally complies with Federal, State and Local Laws or Port Policies, but some minor discrepancies exist	Low probability for external audit issues and/or negative public perception	Lower significance May not require immediate attention
Efficiency Opportunity	An efficiency opportunity is where controls are functioning as intended; however, a modification would make the process more efficient				

APPENDIX B: E-KPI METHODOLOGY

Calculation Methodology for Environmental Key Performance Indicator (E-KPI)

The E-KPI is a tool that demonstrates equivalency with the environmental performance of outbound, on-demand taxis at Sea-Tac Airport. It is based on the "CO₂ emissions generated from a typical passenger trip."

1.0 E-KPI (lbs of CO₂ per typical passenger-trip)

The E-KPI is expressed in units of lbs. of CO₂ per typical passenger-trip and is calculated using the following equation:

E-KPI = (Airport Drop-off Trip Fuel Consumption + Airport Pick-up Trip Fuel Consumption) x Carbon Emissions per Fuel Consumed

Where:

- **Airport Drop-off Trip Fuel Consumption** = $[(1 - \% \text{Pooling Drop-off}) \times 13 \text{ miles/WA-MPG}] + (\% \text{Pooling Drop-off} \times (13 \text{ miles} / \# \text{ of Matched Rides}) / \text{WA-MPG}] \times \% \text{Deadheading}$
- **Airport Pick-up Trip Fuel Consumption** = $(1 - \% \text{Pooling Pick-up}) \times 13 \text{ miles/WA-MPG} + (\% \text{Pooling Pick-up} \times (13 \text{ miles} / \# \text{ of Matched Rides}) / \text{WA-MPG})$
- **Carbon emissions per fuel consumed** = 19.4 lbs. carbon/gallon of gasoline

2.0 E-KPI Inputs

a) **Weighted-Average MPG (WA-MPG)**

The WA-MPG for the TNC's vehicle fleet is calculated by weighting the United States Environmental Protection Agency (EPA) blended highway/city fuel efficiency rating in miles per gallon (MPG), or miles per gallon equivalent (MPGe) for electric vehicles, for each vehicle having provided at least one pick-up event in the measurement period by the number of time a pick-up fee was assessed for that vehicle in the same measurement period.

- Only includes non-commercial vehicles (e.g. UberX and not UberBLACK or Uber For Hire, etc.)
- For simplicity, we will assume the WA-MPG for inbound vehicles is the same as outbound for each TNC.

b) **%Deadheading**

Deadheading is measured relative to outbound trips only. An outbound trip from Sea-Tac Airport is considered to be deadheading if the same vehicle does not have a corresponding inbound revenue-trip that occurred in the preceding 3 hours.

% Deadheading for a measurement period is calculated by adding the total number of outbound trips that have a corresponding inbound trip for the same vehicle in a 3-hour period, divided by the total number of outbound trips, and subtracted from 100%.

c) **%Pooling (or "Ride-sharing") for Drop-Offs and Pick-Ups and U Matched Rides**

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A TNC may be given credit for pooling or ride-sharing only when the pooling is arranged via a trackable option available through its app (e.g. UberPOOL, Lyft Line). Credit is not given for passengers traveling together unless they were actively matched through the TNC's software. Likewise, credit is not given for passengers expressing a willingness to be matched but who do not achieve a successful match for their ride.

A "pooled" revenue trip does not, however, require that all matched passengers begin or end their trip at the Airport. A TNC will receive "pooling" credit for a revenue-trip dropping off or picking up at least one passenger at Sea-Tac Airport, even if one or more of the other matched passengers is dropped off en route to the Airport or picked up en route to the final destination.

Credit for pooling may only be applied to TNC-endorsed, non-commercial vehicles that can travel anywhere in the region. For example, a fixed route, fixed price van service would not qualify a "pooled" in the E-KPI, as the intention is to show equivalency to taxi services, and not shared ride vans.

%Pooling Pick-Up is the percentage of total rides picked up from airport that were matched and %Pooling Drop-Off is the % of total rides dropped off at the airport that were matched.

of matched rides is the number of parties that were involved in the trip to or from the airport. A trip with a single party would have a value of 1.